

### REMARKS

Claims 1, 6-14, 17-26, 29, and 32-36 are all of the claims pending in the present Application. Claims 4, 5, 15, 16, 27, 28, 30, and 31 are canceled above. New claims 32-36 are added.

It is noted that, notwithstanding any claim amendments made herein, Applicant's intent is to encompass equivalents of all claim elements, even if amended herein or later during prosecution.

Claims 18, 19, 26, 27, 28, and 29 stand rejected under 35 USC §112, first and second paragraphs, as allegedly failing written description and enablement requirements, because of the phrase "... substantially same strain on said multilayer quantum well structure" in claim 18. Applicants do not agree with the Examiner's position, since it is noted that the thicknesses of all layers are provided in the specification as filed. However, for purpose of expediting prosecution, Applicants have removed this phrase from claim 18. Therefore, Applicants respectfully request that the Examiner reconsider and withdraw these rejections.

Claims 1, 4-31 stand rejected under 35 USC §112, second paragraph, as allegedly being indefinite, because of the term "substantially". Applicants traverse this rejection by directing the Examiner's attention to MPEP §2173.05(b)D., wherein it is clearly stated that the Court has held this term "... *definite because one of ordinary skill in the art would know what was meant by "substantially equal"* ".

In this regard, it is noted that the Examiner himself points to a description in the specification that would allow one of ordinary skill in the art to understand the meaning of this limitation, particularly when the rejection currently of record relies upon an example wherein there is a 1% difference in compositional ratio. Applicants submit that one of ordinary skill in the art would readily recognize that a 1% difference is not "substantially equal".

However, in an effort to expedite prosecution, this limitation has been removed from the independent claims.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

Claims 1, 4, 7-17, 20-25, and 31 stand rejected under 35 USC §102(e) stand rejected under 35 USC §102(e) as anticipated by or, in the alternative, under 35 USC §103(a) as

unpatentable over US Patent 5,777,350 to Nakamura et al. Claims 1, 4-6, 15-17, 20-25, and 30 stand rejected under 35 USC §102(e) as anticipated by US Patent 5,959,307 to Nakamura et al.

These rejections are respectfully traversed in view of the following discussion.

## **I. The Claimed Invention**

As described and claimed, for example by claim 1, the present invention is directed to a group III nitride compound semiconductor light-emitting device including a light-emitting layer of a multilayer quantum well structure comprising alternately laminated well layers and barrier layers.

An n-type clad layer is in contact with the light-emitting layer and an intermediate layer is in contact with the n-type clad layer at one face thereof and an n-type contact layer at another face thereof.

The n-type clad layer is made thicker than each of said barrier layers and the intermediate layer comprises  $\text{In}_x\text{Ga}_{1-x}\text{N}$ , where  $(0 < x < 1)$ .

With such unique and unobvious features, high light intensity is provided by securing the effect of confining carriers sufficiently in the light-emitting layer while keeping color purity intact.

## **II. The Prior Art Rejections**

The Examiner continues to maintain that Nakamura '350 anticipates and/or renders obvious claims 1, 4, 7-17, 20-25, and 31 and that Nakamura '307 anticipates claims 1, 4-6, 15-17, 20-25, and 30.

In the amended claims, the following points have been clarified.

(i) An intermediate layer is provided so as to be in contact with an n-type clad layer at one face thereof and an n-type contact layer (n+ layer) at another face thereof, wherein the intermediate layer comprises  $\text{In}_x\text{Ga}_{1-x}\text{N}$ , where  $(0 < x < 1)$ .

(ii) An n-type clad layer and barrier layers are formed of substantially the same material (see new claim 33).

(iii) The n-type clad layer, barrier layers, and a cap layer are formed of substantially the

same material (see claim 17).

(iv) The n-type clad layer, barrier layers, and the cap layer comprise GaN (see new claim 34, depending from claim 17).

Nakamura clearly does not teach, suggest, or show the above features. According to the Examiner, the intermediate layer disclosed in Nakamura '350 is a GaN layer 12 of Figure 1, and disclosed in Nakamura '307 is a layer 202 shown in Figures 1-3 thereof.

However, neither Nakamura '350 nor '307 discloses or suggests the intermediate layer provided so as to be in contact with an n-type clad layer at one face thereof and an n-type contact layer (n+ layer) at another face thereof, wherein the intermediate layer comprises  $\text{In}_x\text{Ga}_{1-x}\text{N}$ , where ( $0 < x < 1$ ), as recited in claim 1. Thus, the invention is clearly distinguished from Nakamura.

Moreover, Applicants respectfully traverse the prior art rejection, since one of ordinary skill in the art would readily recognize that Nakamura '350 and/or '307 provide, at most, only the possibility of constructing the claimed invention from the various statements, embodiments, and ranges provided therein. The rejection points to multiple embodiments and statements, "picking and choosing" elements as appropriate to read upon the claimed invention. None of the many embodiments provides all of the elements in the combination defined by the claimed invention.

As clearly stated in MPEP §2121:

- "*A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.*" (emphasis by Applicants); and

- "*The identical invention must be shown in as complete detail as is contained in the ... claim.*" (emphasis by Applicants)

Applicants submit that Nakamura '350 (or '307) does not describe or suggest a structure having all the elements defined by the independent claims, let alone a structure further including the elements added by the dependent claims.

It is submitted that simply choosing various elements from a plurality of embodiments, as required, in order to read upon a claimed combination, would render these elements patentably impotent. Similarly, being able to choose a narrow range from a generic broad

range, as required to read upon a claimed combination, would render the narrow range patentably impotent. That is, according to this technique of evaluation, there would be no possible combination in which this feature or narrow range will have significance to differentiate from the prior art.

As previously explained and highlighted in the specification and with regard to independent claim 18, the patentably significant contribution of the claimed combination of using the specified components having the same composition (new claims 33 and 34) and the narrow ranges is that color purity and light intensity are improved. The recognition of being able to enhance color purity and intensity in this manner is a significant contribution to the art. The prior art of record does not recognize the significance of this same composition and narrow ranges. That is, it was not known that these features discussed in the present invention were significant parameters for color purity.

Because of the lack of teaching the claimed construction of elements, Applicants submit that neither Nakamura '350 nor Nakamura '307 anticipates or renders obvious the present invention.

Moreover, relative to the alternative rejection based on obviousness, Applicants submit that case law clearly demonstrates that the mere possibility of constructing a claimed invention does not provide obviousness. As support, Applicants direct the Examiner's attention to *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977), a case cited in MPEP §§ 2141.02 and 2144.05:

*"Just as we look to a chemical and its properties when we examine the obviousness of a composition of matter claim, it is this invention as a whole, and not some part of it, which must be obvious under 35 U.S.C. §103.... The PTO and the minority appear to argue that it would always be obvious for one of ordinary skill in the art to try varying every parameter of a system in order to optimize the effectiveness of the system even if there is no evidence in the record that the prior art recognized that particular parameter affected the result. As we have said many times, obvious to try is not the standard of 35 U.S.C. §103.... In In re Aller, 220 F.2d 454, 42 CCPA 824, 105 USPQ 233 (1955), the court set out the rule that the discovery of an optimum value of a variable in a known process is normally obvious. We have found exceptions to this rule in cases where the results of optimizing a variable, which was known to be result effective, were unexpectedly good. [cites omitted] This case, in which the parameter optimized was not recognized to be a result-effective variable is another exception."*  
(Emphasis by the Court)

Because of the lack of awareness in the prior art of the specific combination of composition and ranges, Applicants submit that Nakamura '350 also does not render obvious the present invention.

For the reasons stated above, the claimed invention is fully patentable over the cited references Nakamura '307 and '350.

Further, the other prior art of record has been reviewed, but it too even in combination with the two Nakamura references, fails to teach or suggest the claimed invention.

Moreover, as previously pointed out, some of the dependent claims additionally incorporate a number of very limited ranges of layer compositions and thicknesses. The reason for these additional limitations is not, as the Examiner seems to interpret, that these additional limitations are insignificant elements that are included in the broad ranges recited in Nakamura, but rather, that these narrow ranges have been discovered to respectively contribute a new dimension of an overall approach to an LED structure that provides enhanced color purity and an improved intensity for the specific emission wavelength.

### **III. Formal matters and Conclusion**

In view of the foregoing, Applicant submits that claims 1, 6-14, 17-26, 29, and 32-36, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

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T36-120877M/KOH

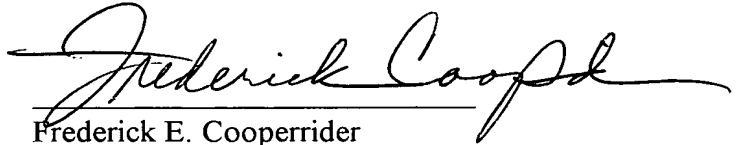
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The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: \_\_\_\_\_

5/25/04



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